REMARKS

The present application includes claims 1-30 with claims 1-6, 11, 15 and 20-21 as drawn to the elected species of figure 6. Claims 1, 11 and 21 have been amended. Applicants respectfully point out that with relation to the subject matter of claim 11, which is directed to a conductor trench 12, which is rectangular in cross section, is in fact shown in figure 6. The dependency of claim 11 has been amended to depend from claim 1, the independent claim of the elected species. Accordingly, it is respectfully requested that claim 11 is drawn to the elected species of figure 6 and should not be withdrawn from consideration. Claim 22 is being amended to make it consistent with the May 14, 2002 amendment which amended the specification to refer to the "contact opening" instead as a "through hole."

As to the § 103 rejection, applicants respectfully request reconsideration. It is noted that claim 1 as currently amended is directed to a circuit board consisting of at least two individual circuit board layers. Each circuit board has at least one microstructured positioning formation (16) which is comprised of at least one projection and at least one recess positioned in interconnecting engagement. The projection is formed on at least one of the first and second sides of one of the circuit board layers (10) and the recess is formed on at least one of the sides of another circuit board layer. The projection and the recess are positioned in interconnecting engagement with one another to allow for precise positioning of the circuit board layers relative to each other. An important feature of the microstructured positioning formation is that it is formed during formation of the circuit board layers, as required by claim 1. Claim 1 further requires that at least one microstructured conductor trench (12) is formed on one of the functional sides of a circuit board layer. It is respectfully submitted that none of the references

either alone or in combination with one another teach or suggest the claimed invention.

In Crumly U.S. 6,007,669 applicants respectfully disagree that the raised features (14) in Crumly are comparable to the claimed microstructured positioning formations. From a technical standpoint, the raised features (14) in Crumly cannot serve for a precise positioning of one of the dielectric layers with respect to the other. In Figure 1, the raised features (14) are part of a flexible circuit layer (4) which is placed onto the respective dielectric layer (10). If the raised features (14) were to serve as positioning formations, it is imperative to first position the raised features themselves at precisely defined positions. However, in Crumly there is no indication whatsoever that the raised features (14) are positioned with high accuracy. In fact, Crumly makes no mention that the raised features (14) serve for positioning one dielectric layer with respect to the other. Rather, the raised features (14) are meant for piercing through an intermediate adhesive layer (16) or (24) or additional materials (27) in the Z-access direction in order to make electrical contact with the contact pad (22) or the electrical trace (12), (21) of an adjacent electrical circuit. (Col. 2, lines 49-54). So, it is obvious that the raised features (14) are provided to insure an electrical connection between adjacent electrical circuits through the adhesive (16) or (24) and materials (27). The raised features do not serve any positioning function. It is noted that the positioning of the dielectric layers with respect to each other is achieved by some other means based on the assembly steps shown in Figs. 3 and 4. In particular, Fig. 3 points out that the adjacent circuit board layers are separated by the intermediate adhesive layer (16). For this reason, the raised features (14) cannot provide for a positioning in interconnecting engagement with the contact pads (34) without some other means being used to precisely position the layers with respect to one

another.

Another distinguishing characteristic of the claimed invention over the teachings provided in Crumly, concerns how the microstructured positioning formations are formed. Crumly's raised features (14) are applied separately after formation of the circuit board layer. The raised features (14) are formed either by mechanical pressing, by plating up a metal, or by depositing a bump as desired. (Col. 2, lines 56-61). The underside or volume of the raised feature (14) is filled with some sort of material such as epoxy 25 or adhesive. (Col. 2, line 66 to col. 3, line 1). Crumly is precisely what applicants teach away from. In fact, on page 3 of applicant's original specification, applicants discuss the disadvantages of separate finishing operations for the individual layers. The advantages of the claimed invention are that there is no need for a subsequent machining step in order to configure the geometric structures with high positional accuracy (page 3, lines 17-23).

To emphasize this feature of the claimed invention, claim 1 has been amended to recite that the microstructured positioning formations are formed integrally during formation of the circuit board layers. The advantages of this feature is described in the specification:

> "Since the positioning formation are also formed already during the protection of the individual layers, the arrangement thereof in relation to the microstructures arranged on the functional sides and having specific functions is predefined precisely, so that all of the microstructures of the individual layer will then later be in precise alignment with respect to each other. (Page 3, lines 23-28)."

Therefore, it is respectfully submitted that claim 1 is distinguishable over

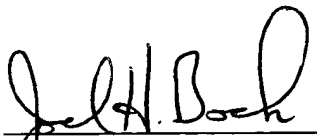
Crumly for the additional reason that the raised features are not formed integrally during formation of the circuit board layer.

In addition, claim 1 is further believed to be distinguishable because Rokugawa U.S. 6,434,819 because Rokugawa '819 is not properly combinable with Crumly '669 to teach or suggest a conductor trench being provided with a metalization. Rokugawa suggests using only embedded conductors. Rokugawa's embedded conductors teach the opposite of plating up a metal in order to insure electrical connection between adjacent circuit board layers. Crumly's raised features (14) are made by plating up metal which is the opposite of Rokugawa. For these reasons, it would not be obvious to combine these references.

Even a logical combination of Rokugawa and Crumly teaches away from the claimed conductor trench. If Rokugawa was combined with Crumly, Crumley's raised features (14) and the copper traces (12), (21) would be substituted by Rokugawa's embedded conductor trenches. As a result, there are no more raised features which allegedly serve for a positioning. Therefore, even a logical combination of Rokugawa and Crumly also does not teach the claimed invention.

It is respectfully submitted that claims 1-6, 11, 15 and 20-21 are distinguishable over the cited references. Reconsideration and allowance is respectfully requested.

Respectfully submitted,



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